HEALTH AND SAFETY FIELD MANUAL

AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

MWH File No. 2090603

Prepared For:

American Chemical Service NPL Site RD/RA Executive Committee
Griffith, Indiana

Prepared By:

MWH Americas, Inc.
175 West Jackson Boulevard
Suite 1900
Chicago, Illinois 60604

June 2005

MWH

MWH

July 15, 2005

Mr. Kevin Adler
Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Health and Safety Field Manual
ACS NPL Site

Dear Mr. Adler:

Please find enclosed three copies of the Health and Safety Field Manual for the ACS NPL Site for your files. The manual has been distributed to the project team to use as a practical guide to the ongoing activities at the site. The Manual is designed to allow for revisions in the future as additional field tasks are identified.

We are also sending three copies of the manual to the IDEM and one copy to Black & Veatch. If you need additional copies, please let me know and we will forward them to you.

Sincerely,

MWH Americas, Inc.

Peter J. Vagt, Ph.D., CPG
Vice President

cc: Prabhakar Kasarabada, IDEM (3 copies)
Larry Campbell, B&V (1 copy)
Barbara Magel, Karaganis White & Magel, LTD (1 copy)
ACS Tech Committee (1 copy each – cover letter only)

CAD/PJV/jmf
J:\209\0601 ACS\Health and Safety Field Manual\HASP Field Manual EPA Cover letter.doc
2090603.0307

175 West Jackson Boulevard
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Chicago, Illinois
60604-2814

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Prepared For:

American Chemical Service NPL Site RD/RA Executive Committee
Griffith, Indiana

Prepared by: _____ 7/11/05
Chris A. Daly, P.E. — Date
Senior Engineer

Approved by: _____ 7/11/05
Peter Vagt, Ph.D., CPG — Date
Project Manager

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ACRONYMS AND ABBREVIATIONS

ACS	American Chemical Service, Inc.
AS	Air sparge
BWES	Barrier Wall Extraction System
chem-ox	Chemical oxidation
CPR	Cardiopulmonary resuscitation
DPE	Dual-phase extraction
ES&H	Environmental Safety and Health
GWTP	Groundwater Treatment Plant
IDEM	Indiana Department of Environmental Management
ISVE	In-situ Vapor Extraction System
K-P Area	Kapica-Pazmey Area
MWH	MWH Americas, Inc.
NPL	National Priorities List
O&M	Operations and Maintenance
OFCA	Off-Site Containment Area
ONCA	On-Site Containment Area
PCB	Polychlorinated Biphenyls
PGCS	Perimeter Groundwater Containment System
PID	Photo-ionization detector
PPE	Personal Protection Equipment
psi	Pounds per square inch
PSVP	Performance Standard Verification Plan
RCRA	Resource Conservation and Recovery Act
SBPA	Still Bottoms Pond Area
SSP	Site Safety Plan
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound

1.0 INTRODUCTION

This Health and Safety Field Manual identifies ongoing site activities at the American Chemical Service, Inc. (ACS) National Priorities List (NPL) Site in Griffith, Indiana (Figure 1). For each activity MWH America, Inc. (MWH) has:

- Provided a step-by-step procedure;
- Evaluated potential risks to human health; and
- Identified the necessary precautions and personal protective equipment (PPE) that should be taken in order to minimize risk to human health.

1.1 PURPOSE

Activity at the ACS Site is beginning to transition from site investigation, construction of remediation facilities, and interim operations and maintenance (O&M) to long-term O&M activities. MWH has been conducting the interim O&M activities for several years at the ACS Site. Experience gained during the operational history has prompted MWH to reassess certain O&M protocols and update and document them when necessary. Thus, this Health and Safety Field Manual will provide the most up to date health and safety considerations and procedures that must be followed when performing O&M activities. In addition, new health and safety procedures as well as revisions to existing health and safety procedures will be incorporated into this document.

This manual is not intended to replace the previous health and safety documents. Rather, it is designed to present the health and safety information in a concise format that on-site personnel can use to quickly familiarize themselves with relevant health and safety issues prior to conducting field work or O&M activities. It also contains a summary of the site history; previous remediation efforts conducted at the site; and previous health and safety documents written for the site. By combining summaries of relevant site histories with current health and safety practices in a single portable document, this document serves as a tool that new and current on-site personnel can use to familiarize themselves with potential health risks at the ACS site.

1.2 ACS OPERATIONAL HISTORY

The ACS facility began operation in May 1955 as a solvent recovery facility. Solvent recovery remained the primary operation although in the late 1960s they began to treat rope with fungicide, treat ski cable, and manufacture brominated compounds. In 1961, ACS sold a two-acre parcel to John Kapica, and in 1962 Mr. Kapica began operating a drum reconditioning business. Kapica Drum was sold to Pazmey Corporation in February of 1980. Operations continued until the Pazmey Corporation was sold in March 1987.

ACS' solvent recovery operations involved spent solvent mixtures containing alcohols, ketones, esters, chlorinated solvents, aromatics, aliphatics, and glycols. In the early years of operation, spent solvents were stored in 55-gallon drums at various locations at the Site. Solvent recovery was performed in batch evaporation units, which were charged by pumping material directly from 55-gallon drums into the evaporation vessels. Still bottoms from the evaporation vessels were disposed in the Still Bottoms Pond Area (SBPA) prior to the installation of incinerators. The incinerators were used to burn still bottoms and other non-reclaimable materials. They were dismantled in 1977. From 1970 through 1975, solvent recovery operations at the Site where similar to those of the 1960's, with an increasing percentage of shipments arriving via bulk tanker trucks. Additional facilities were constructed in the 1970's including a lubricant manufacturing facility, a soldering flux operation, a chemical additive manufacturing facility, and an epoxidation plant. The lubricant manufacturing process and soldering flux operation were both discontinued prior to 1990. A hazardous waste drum unloading dock, including a storage area, sump, and spill containment, was also constructed as part of the solvent recovery operation.

Hazardous waste operations ceased in September 1990 when ACS lost its Resource Conservation and Recovery Act (RCRA) interim status. Clean-closure of the hazardous waste units was accepted by the Indiana Department of Environmental Management (IDEM) in 1992. ACS continues to operate as a chemical production facility.

1.3 REMEDIATION EFFORTS CONDUCTED AT ACS

Past operations have impacted five land disposal areas (Figure 1): the On-Site Containment Area (ONCA), the SBPA, the Treatment Lagoon, the Off-Site Containment Area (OFCA), and the Kapica-Pazmey Area (K-P Area). The OFCA and K-P Area comprise approximately one-half of the 30-acre site and together they are referred to as the Off-Site Area. The ONCA, SBPA, and Treatment Lagoon are contained within the larger site area referred to as the On-Site Area (the On-Site Area contains the entire ACS operating facility). In addition, the wetlands areas to the west of ACS were found to be impacted with polychlorinated biphenyls (PCBs), likely through runoff originating on the ACS facility.

A continuous barrier wall was constructed around the On-Site Area and Off-Site Area. The barrier wall encloses the delineated source areas and buried waste at the Site. A groundwater extraction system inside the barrier wall, comprised of nine 100-foot long extraction trenches and one 400-foot long extraction trench, was installed to maintain a hydraulic capture zone within the barrier wall, and is referred to as the Barrier Wall Extraction System (BWES). The BWES is supplemented in the On-Site Area by dual-phase extraction wells installed as part of the in-situ soil vapor extraction (ISVE) system. A groundwater pumping system, the perimeter groundwater containment system (PGCS), was installed in the wetland area. This pumping system provides containment for a groundwater plume in the northwest portion of the Site.

The groundwater treatment plant (GWTP) was constructed to treat groundwater from the BWES and PGCS; the GWTP treats groundwater using phase separation, air stripping, biological degradation, metals precipitation, filtration, and carbon adsorption methods. Groundwater from the BWES and PGCS continues to be treated through the GWTP and is discharged to the wetlands in accordance with standards issued by the United States Environmental Protection Agency (U.S. EPA) and IDEM. Based upon the GWTP effluent data and groundwater levels collected from within the barrier wall, these systems have successfully isolated the source area of the Site. They prevent further off-site groundwater contamination from occurring and provide active treatment of groundwater from within the barrier wall.

MWH installed two ISVE systems, one in the Off-Site Area and one in the On-Site Area. Vapors removed by the ISVE systems are piped to the GWTP where they are destroyed by two thermal oxidizers. Effluent vapor from the thermal oxidizers are scrubbed in scrubber units and discharged to the atmosphere. Some of the ISVE wells in the On-Site Area also contain dewatering pumps that are used to reduce the water table within the ISVE wellfield. Water pumped from these areas is treated by the GWTP. Air sparge (AS) points have also been installed in both the Off-Site and On-Site Area ISVE Systems. The purpose of the AS points is to mobilize contaminants and oxygenate the groundwater and stimulate aerobic biodegradation.

In addition to the on-site contamination, to the south of the Site a plume of impacted groundwater has been determined to extend to the south and southeast. Recent investigations immediately outside of the barrier wall in the South Area have identified an area of soil contamination near the water table that has likely been the source for this groundwater plume. MWH is currently (spring and summer 2005) using in-situ chemical oxidation (chem-ox) to treat the soil contamination, thereby reducing the source of groundwater contamination in the South Area. Chem-ox treatment of the source area is an ongoing effort.

1.4 PREVIOUS HEALTH AND SAFETY DOCUMENTS

Prior to conducting investigative work at ACS, MWH authored a Predesign *Site Safety Plan* (SSP) in January of 1996 (Montgomery Watson, 1996). The Predesign SSP provided guidelines and procedures protective of site personnel during site investigative activities. An SSP Addendum was written in June of 1999 (Montgomery Watson, 1999) to provide additional health and safety procedures for hazards associated with site remedial activities designed to treat soil and groundwater contamination. These activities included construction of the GWTP. Contaminated groundwater is pumped to the GWTP as part of an ongoing effort to maintain target groundwater levels where ISVE systems have been installed. An "Emergency Response and Contingency Plan" was included as part of the *Operations and Maintenance Manual for the Groundwater Treatment Plant* (MWH, 2002). It provided health and safety procedures in the event of an accident or emergency during GWTP O&M activities. A *Health and Safety Addendum for Water Level Gauging Within Contaminated Source Areas* was written in April 2004 (MWH, 2004). It included an assessment of risks associated with gauging water levels within the two ISVE well fields and provided a general description of the respiratory protection program.

2.0 EMPLOYEE TRAINING REQUIREMENTS

Personnel involved in site activities must participate in routine health and safety education and training programs. These programs are designed to provide employees with a thorough knowledge of hazardous materials, health and safety potentials, and compliance with federal OSHA 29 CFR 1910.120(e): 40-hours initial off-site instruction, 24-hours on-site supervised work, 8-hour annual review course, additional 8-hour specialized training for supervisors, and any necessary U.S. EPA requirements. Verification of employee training will be maintained in the field files during site operations and returned to the office files each time field operations cease.

All personnel at ACS must also participate in a medical surveillance program under the direction of an occupational physician. This program must include baseline, annual or bi-annual, and exit examinations. If, throughout the course of work at ACS, there is evidence of an exceptional occupational exposure, additional medical testing outside the scope of the annual or bi-annual exams may be performed. Personnel will also be evaluated to determine if they are physically able to perform work while using respiratory protective equipment, in compliance with 29 CFR Part 1910. MWH will maintain documentation of medical clearance for all personnel working at ACS in the field files during site operations.

The MWH On Site Environmental Safety and Health (ES&H) Coordinator will have received additional training related to specific responsibilities. In addition, the On Site ES&H Coordinator will be certified and current in Red Cross first aid and cardio-pulmonary resuscitation (CPR). The On Site ES&H coordinator will also conduct daily safety briefings each morning that site investigation or construction activities take place. Emergency procedures will be reviewed with Site personnel. The use, limitation, and inspection of personal protective equipment will also be discussed.

3.0 ACS SITE VISITATION REQUIREMENTS

All personnel who visit the ACS Site must sign the logbook posted outside the GWTP office and notify the Lead Site Operator, Lee Orosz. The Lead Site Operator must also have proper documentation for all personnel prior to commencement of work activities (i.e., 40-hour training certification, 8-hour refresher certification, medical clearance, and others if applicable).

Access to the ACS facility itself should only occur with permission and knowledge of Lee Orosz. Prior to the first visit to the ACS facility, MWH personnel are required to attend a health and safety briefing conducted by ACS representatives.

4.0 ONGOING SITE ACTIVITIES

Health and safety protocols were established for investigative, construction, and interim O&M activities at the ACS site and, in most cases, have appeared in previous health and safety documents. New site activities are required as part of the long-term O&M. The health and safety procedures for these activities are new and have not appeared in previous documents.

4.1 O&M ACTIVITIES WITHIN THE GWTP

O&M activities within the GWTP include replacing the activated carbon in the activated carbon columns, performing periodic maintenance on the sand filters, and overseeing the delivery of chemicals. Health and safety protocols for these activities are included in Appendix A. Additional health and safety protocols for general maintenance procedures, including Energy Control Program Lockout/Tagout, are included in the MWH ES&H Procedures. Current procedures are available on the ES&H Website (KNet; Operations; Americas; Related Sites; ES&H Website).

4.2 ISVE SYSTEM O&M ACTIVITIES

In accordance with the 1999 Performance Standard Verification Plan (PSVP), the water levels in select ISVE wells and AS points are to be measured as part of normal O&M activities along with specific performance data for each ISVE system. Five ISVE wells in the On-Site Area ISVE System are currently being operated as product recovery wells and periodically require removal of product from them using dedicated pumps. Health and safety protocols for these activities are included in Appendix B.

4.3 SITE INVESTIGATION OUTSIDE OF BARRIER WALL

In accordance with the 1999 PSVP and the 2002 Revised Long-Term Groundwater Monitoring Plan, MWH measures water levels and collects groundwater samples from monitoring wells according to the following schedule:

- Water levels are measured quarterly
- Groundwater samples are collected semi-annually

MWH also conducts other site investigation/remediation activities. These activities include soil sampling, monitoring well installation or abandonment, and chem-ox remediation through direct push rods. Such activities occur on an as-needed basis and, as such, are not conducted according to a set schedule. Health and safety protocols for these activities are included in Appendix C.

5.0 KEY PERSONNEL

5.1 KEY PROJECT PERSONNEL

The following table provides contact information for key project personnel

KEY MWH PROJECT PERSONNEL

Project Title	Name	Location	Office and Cell Phone Number(s)
Project Coordinator	Joseph Adams, P.E.	DEN-2	(O) 303-410-4040 (C) 303-882-9127
Client Services Manager	Peter J. Vagt, Ph.D., CPG	CHI-4	(O) 312-831-3466 (C) 630-215-8025
Project Manager	Christopher A. Daly, P.E.	CHI-4	(O) 312-831-3415 (C) 630-567-2649
Construction Manager	Todd A. Lewis	CHI-4	(O) 312-831-3478 (C) 630-215-9603
Geology/Hydrogeology Task Leader	Peter J. Vagt, Ph.D., CPG	CHI-4	(O) 312-831-3466 (C) 630-215-8025
Engineering Task Leader	Christopher A. Daly, P.E.	CHI-4	(O) 312-831-3415 (C) 630-567-2649
GWTP Technical Lead	Jonathan D. Pohl, P.E.	CHI-4	(O) 312-831-3431 (C) 708-710-9145
Lead Site Operator	Lee Orosz	Site	(O) 219-924-4607 (C) 219-218-1329
On Site ES&H Coordinator	Lee Orosz	Site	(O) 219-924-4607 (C) 219-218-1329
MWH ES&H Regional Manager	Jim Craven	OKR-1	(O) 865-483-8271 (C) 865-621-9255
ES&H Advisor	Mike Grasso	DEN-2	(O) 303-439-2838 (C) 630-846-6429

5.2 EMERGENCY CONTACT INFORMATION

The following table provides emergency contact information:

EMERGENCY CONTACT PERSONNEL

Title	Name	Office and Cell Phone Number(s)
U.S. EPA Remedial Project Manager	Kevin Adler	(312) 886-7078
IDEM Project Manager	Prabhakar Kasarabada	(317) 234-0352
Hospital - Community Healthcare System, Munster IN	N/A	ER (219) 836-4511 Main (219) 836-1600
Fire Department	N/A	911
Police	N/A	911
Occupational Health Clinic (WorkCare)	N/A	(800) 455-6155
Indiana Underground Plant Protection Service (Utility Location)	N/A	(800) 382-5544
Poisonous Information Center	N/A	(800) 222-1222

5.3 EMERGENCY RESPONSE PROCEDURES

In the event of a medical emergency at a work site, personnel will act quickly and reasonably to remedy the situation. The On Site ES&H Coordinator will give directions as to how to proceed. If the ES&H Coordinator is incapacitated by an injury, an appropriate local emergency response agency shall be contacted.

ACS has its own Site Health and Safety Plan (included as Appendix J of the 1996 SSP) and available in the GWTP office. The ACS Plan incorporates an Emergency Notification System for all on-site contractors.

For activities performed outside of the GWTP, each site vehicle will contain a first aid kit, phone, and emergency response phone numbers. An emergency route is provided as Figure 3. Special care will be taken if rescue efforts are necessary. Personnel shall utilize extreme caution and take steps to be as adequately protected as possible before attempting such a rescue.

In the event of a work related incident, illness, or vehicle accident, the employee should seek immediate and appropriate medical attention (i.e. on-site first aid kit, emergency room, via 911, designated occupational health clinic, or personal physician). The employee should then contact the On-Site ES&H Coordinator, the Project Manager, and the MWH ES&H Regional Manager, as soon as possible (see contact information in Section 5.1). Immediately

report work-related fatalities, hospitalization for more than observation, or dismemberment to the On-Site ES&H Coordinator and the MWH ES&H Regional Manager. Vehicle accidents should be reported to the MWH Insurance and Claims Administrator.

The employees supervisor or a MWH ES&H representative should complete a draft of the Incident Report Form and forward it on the MWH ES&H Recordkeeping Manager within 24 hours of the incident. For motor vehicle accidents, a Motor Vehicle Report Form should be completed and sent to the MWH Insurance and Claims Administrator with a copy going to the MWH ES&H Recordkeeping Manager.

The MWH ES&H Department telephone number is 865-483-8271. The telephone number for reporting vehicle accidents is 303-533-1900 and the contact is Christine Martin.

6.0 REVISIONS

As site conditions change over time, it is possible that existing health and safety procedures will need to be revised to adapt to new tasks and changes in tasks and site information in order to ensure worker safety. New O&M procedures may also be incorporated into ACS site activities and will require health and safety procedures. Thus, new procedures will also be incorporated into the document.

6.1 REVISION APPROVAL

New or revised health and safety procedures will first be subject to an internal review by the project team to ensure that they are both protective of human health and practical to implement. After internal approval, they will be forwarded to the MWH Corporate ES&H Organization for review. The focus of the review will be to confirm whether the proposed procedures are sufficiently protective of human health. Changes recommended by the MWH Corporate ES&H Organization will be reviewed by the project team prior to finalization to ensure that they are consistent with the ACS operating Procedures. All issues will be resolved between the project team and MWH Corporate ES&H prior to finalizing the document.

6.2 DISTRIBUTION OF FIELD MANUAL AND REVISIONS

Copies of this field manual will be provided to all on site personnel, ACS task managers, the Site Safety Officer, and the ACS project management team. A copy will also be provided to the MWH ES&H Regional Manager. One copy will be kept in the GWTP office at the ACS site, for easy reference by staff members conducting fieldwork. MWH will also provide copies for the U.S. EPA and their oversight contractor.

Revisions of this manual are to be incorporated into the appropriate part of Section 2.0 of this document. Revisions should be distributed to any MWH staff member with a copy of this document. MWH will also provide revisions to the U.S. EPA and the U.S. EPA's oversight contractor. Revisions should also be incorporated into the copy kept in the GWTP office at the ACS site. All revisions should be logged into the attached Revision Log.

7.0 REFERENCES

Current procedures available on the ES&H Website (KNet; Operations; Americas; Related Sites; ES&H Website).

MWH. *Health and Safety Addendum for Water Level Gauging Within Contaminated Source Areas.* April 2004.

MWH. *Revised Long-Term Groundwater Monitoring Plan.* September 2002.

MWH. *Operation and Maintenance Manual for the Groundwater Treatment Plant.* February 2002.

Montgomery Watson. *Site Safety Plan Addendum.* June 1999.

Montgomery Watson. *Site Safety Plan.* January 1996.

MBM/RAA/JDP/PJV/CAD/jmf/JWC/jmf
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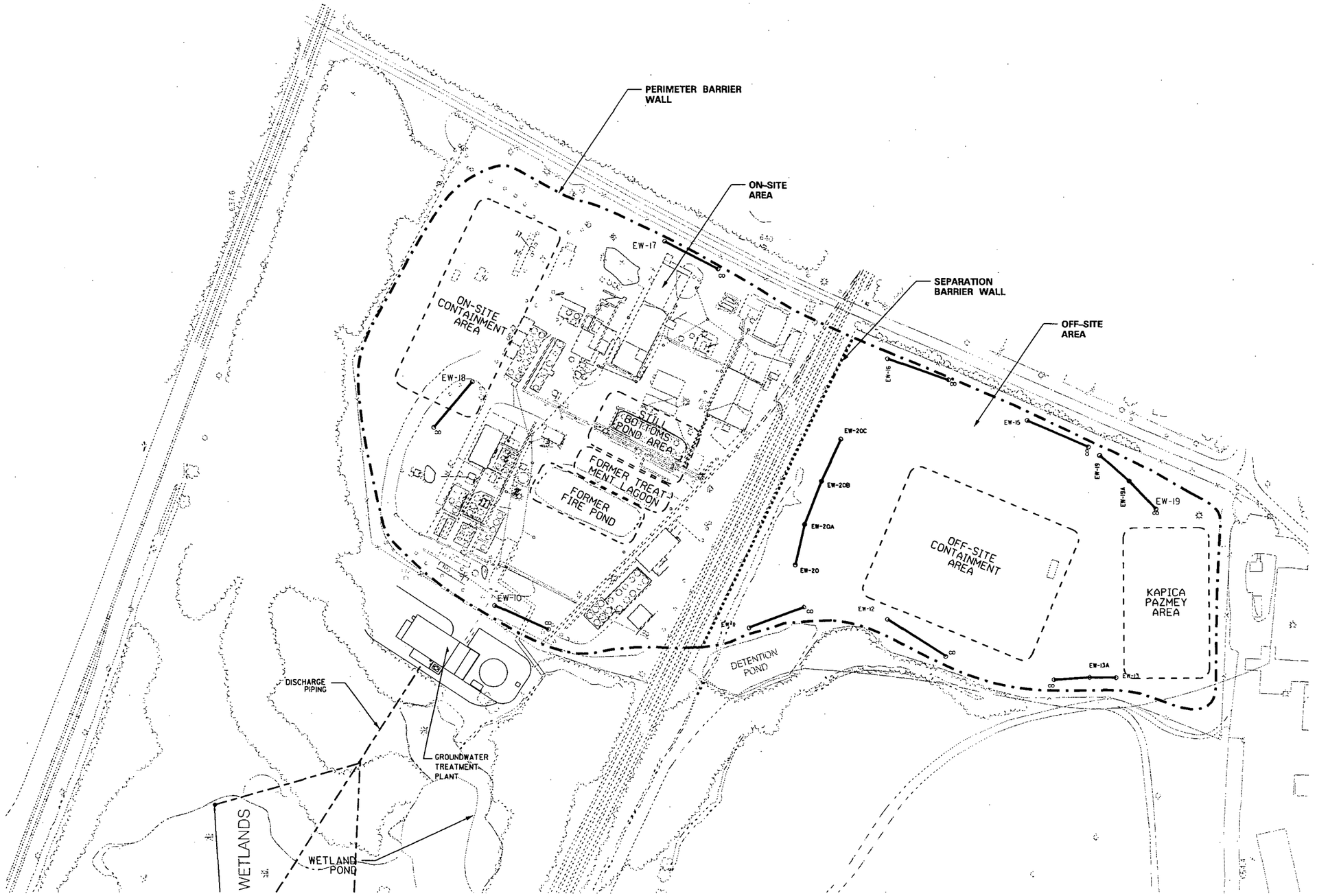
Figures

FIGURES



REV	DATE	BY	DESCRIPTION

SCALE: AS SHOWN

DESIGNED RAA
DRAWN MM
CHECKED RAA

SUBMITTED BY
ROBERT A. ADAMS (PROJECT MANAGER) — LICENSE NO. — DATE
PETER VAGT (COMPANY OFFICER) — LICENSE NO. — DATE

MWH

ACS RD/RA GROUP
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

SITE LAYOUT MAP

FIGURE 1

Plot Date: 02-JUN-2005

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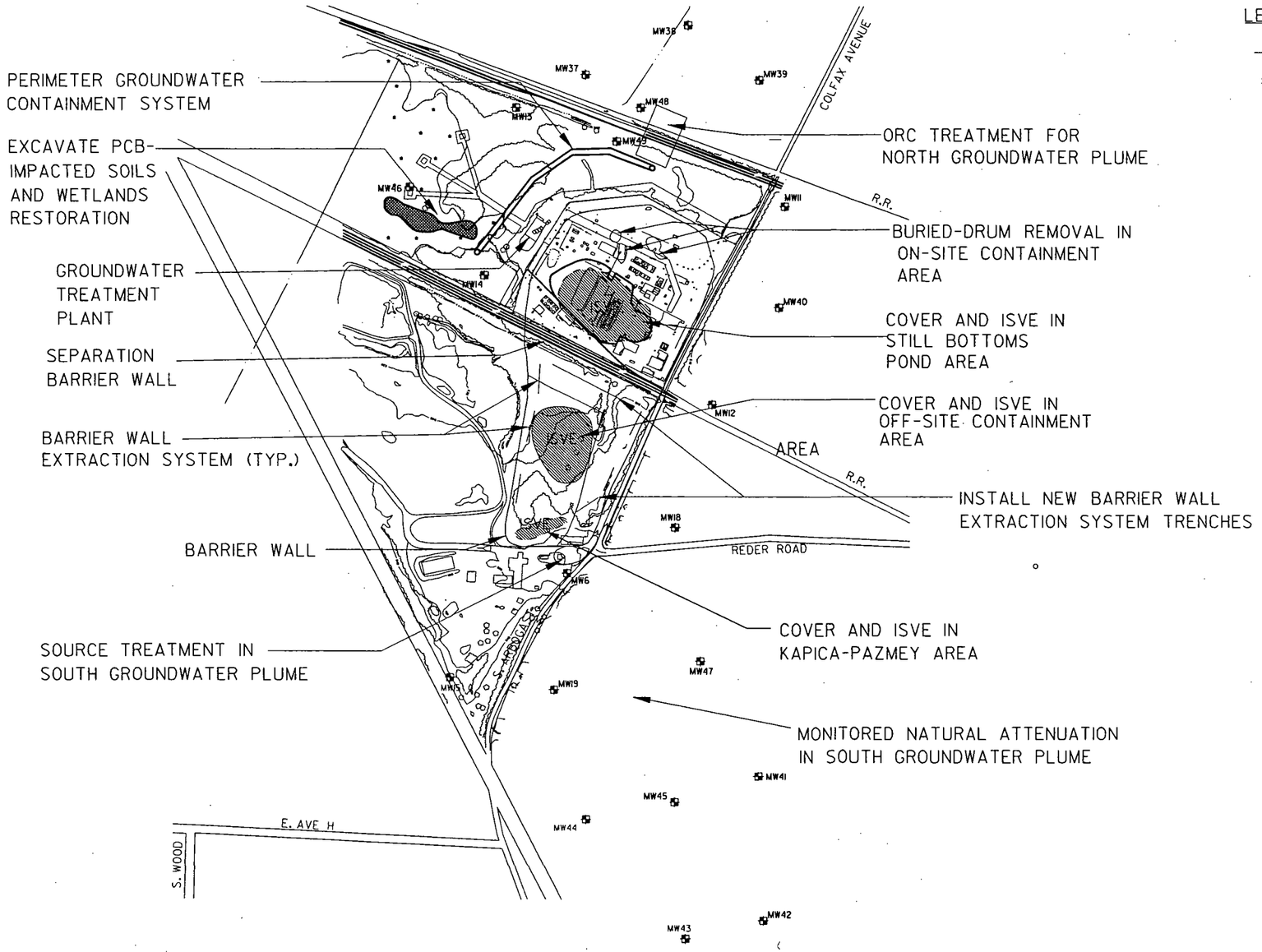

LEGEND

- BARRIER WALL
- PERIMETER GROUND WATER CONTAINMENT SYSTEM
- AREA TO BE TREATED WITH ISVE
- CAP BOUNDARY
- MW41 MONITORING WELL

N

0 100 600
SCALE IN FEET

NOTE: FINAL REMEDY REMEDIAL ACTIONS

REV	DATE	BY	DESCRIPTION

SCALE: AS SHOWN

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED RAA
DRAWN RC
CHECKED RAA

SUBMITTED BY
ROBERT A. ADAMS (PROJECT MANAGER) LICENSE NO. DATE
(COMPANY OFFICER) LICENSE NO. DATE

MWH

ACS RD/RA GROUP
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

100% REMEDIAL DESIGN

OVERALL REMEDIAL ACTIONS PLAN

SHEET 2

Plot Date: 02-JUN-2005

File: J:/209/060\acs/Health and Safety Field Manual/RFB/FINAL_REMEDY_MAP.dgn

HOSPITAL ROUTE

TO CHICAGO

TOTAL DISTANCE - 8 MILES (ABOUT 15-20 MINUTES)

INTERSTATE I-80/I-94

N

RIDGE ROAD OR ROUTE 6

CALUMET AVE.

INDIANAPOLISE BLVD.

CLINE AVE.

COLFAX AVE.

MUNSTER COMMUNITY HOSPITAL

(219) 836-5167
9003 CALUMET AVE.
MUNSTER, IN 46321

45th AVE.

DIRECTIONS

- FROM THE ACS FACILITY, TURN LEFT (NORTH) ON COLFAX AVE.
- TURN LEFT (WEST) ON 45th AVE.
- TURN RIGHT (NORTH) ON CALUMET AVE.
- TURN RIGHT (EAST) INTO THE HOSPITAL.

MAIN STREET

RAILROAD TRACKS

MWH OFFICE AT ACS SITE

(219) 924-4607
410 S. COLFAX AVE.
GRIFFITH, IN 46319

SCALE			FIGURE
NOT TO SCALE	MWH MONTGOMERY WATSON HARZA	ACS RD/RA GROUP AMERICAN CHEMICAL SERVICE SUPERFUND SITE GRIFFITH, INDIANA	SITE LOCATION MAP AND HOSPITAL ROUTE 3

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APPENDIX A

O&M Activities within the GWTP

- **Activated Carbon Changeout**
- **Sand Filter Maintenance**
- **Chemical Deliveries**

Activated Carbon Changeout

ACTIVATED CARBON CHANGEOUT

Purpose

Periodically the sorptive capacity of the activated carbon will become exhausted and will require replacement.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Dermal contact with activated carbon	Wear Level D protection
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Falling hazard associated with working on top of carbon column	Wear safety harness if working atop carbon column
Damaged hoses may break while under load pressure	Inspect hoses and connectors prior to use

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields

Potentially Required PPE

1. Safety harness secured to an approved anchor point in a manner that limits any potential fall to a maximum free fall of 6 feet.

Hazard Identification and Management

1. Close all influent and effluent lines to the activated carbon tanks.
2. Ensure that all pumps to the activated carbon tanks are turned off.
3. If working on top of the carbon column use a safety harness (be sure to inspect harness for signs of wear prior to use) that is properly secured in a manner that will break the fall prior to impact.
4. When adding air to pressurize carbon column, do not allow air pressure to exceed 50 pounds per square inch (psi).
5. After using water from the fire hydrant be sure to replace the hydrant caps.

Sand Filter Maintenance

SAND FILTER MAINTENANCE

Purpose
Periodic maintenance on the sand filter is required to ensure that it remains in proper working order.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Dermal contact with potentially contaminated sand	Wear Level D protection
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Falling hazard associated with working on top of carbon column	Wear safety harness if working atop carbon column

Required PPE
1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields

Potentially Required PPE
1. Safety harness secured to an approved anchor point in a manner that limits any potential fall to a maximum free fall of 6 feet.

Hazard Identification and Management
1. If working on top of the sand filter use a safety harness (be sure to inspect harness for signs of wear prior to use) that is properly secured in a manner that will break the fall prior to impact.

Chemical Deliveries

CHEMICAL DELIVERIES

Purpose

Various chemicals are periodically delivered to the GWTP for use in the water treatment process. These chemicals are used as part of the normal operation of the GWTP.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Dermal contact with chemicals	• Know location of hand and eyewash stations • Wear Level D protection
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Being struck by equipment/vehicles	Wear brightly colored traffic safety vest when working in highly trafficked areas

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields
5. Face shield when connecting or unconnecting hoses
6. Traffic safety vest

Potentially Required PPE

1. Chemical-resistant coveralls (Tyvek or SARANEX) (optional – personnel desiring additional protection from potential splashes)
2. Chemical-resistant overboots (optional – personnel desiring additional protection from potential splashes)

Hazard Identification and Management

1. Ensure that truck driver has appropriate MSDS.
2. Make driver aware of hand and eyewash stations.
3. Confirm that truck is equipped with warning alarm when driving in reverse.
4. Confirm that trailer is parked on the concrete decontamination pad prior to attaching any hoses or pipes.
5. Truck driver must don appropriate PPE prior to connecting any hoses or pipes.
6. Inspect hoses and connectors for evidence of damage or excessive wear, which may lead to leaks.
7. Confirm that sump drain is configured to direct any leaking chemical into the GWTP.

8. Confirm that the chemical will be delivered to the appropriate tank.
9. Driver must be present throughout the duration of the chemical transfer.
10. Once chemical transfer is complete, confirm that all hoses/pipes are empty and free of chemical.
11. Clean up any spilled chemical in accordance with MSDS.

APPENDIX B

ISVE System O&M Activities

- **Collecting ISVE System Data**
- **Gauging Water Levels in ISVE Wells and AS Points**
- **Product Removal from ISVE Wells**
- **DPE Pump Maintenance**

Collecting ISVE System Data

COLLECTING ISVE SYSTEM DATA

Purpose

Performance for both ISVE systems is monitored by collecting data for active ISVE wells and combined ISVE system data.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Inhalation of contaminant-laden vapors	Keep blower shed door open for added ventilation. Activate building's ventilation fan. Ensure that effluent from vacuum pump is directed outside the building. Periodically monitor breathing zone with photo-ionization detector (PID). If concentrations exceed 5 ppm, shut off vacuum pump and allow space to ventilate. Do not proceed with monitoring until concentrations have decreased below 5 ppm.
Dermal contact with ISVE condensate	Wear Level D protection when in blower shed
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Excessive noise	Don earplugs upon entering blower shed. Each shed is equipped with an earplug dispenser.
Lacerations/bumps from working in close quarters near piping, sample ports.	Wear hardhat and safety glasses. Wear leather work gloves, if needed. Be aware of surroundings.
Thermal Stress	Dress appropriately for weather, take breaks as necessary, and remain adequately hydrated.

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields

Potentially Required PPE

1. Leather work gloves

Hazard Identification and Management

1. Enter blower shed. Activate building's ventilation fan.
2. Record system data from various gauges and meters.
3. Screen volatile organic compound (VOC) concentrations in active ISVE wells.
   a. Ensure that effluent from vacuum pump is vented to outside.
   b. Watch for condensate in vapor stream that could overflow water traps.
4. Record system data for AS points.
5. If ambient air dilution valve requires adjustment, a potential hazard may arise due to close proximity to vacuum blower. Avoid loose clothing, maintain balance and do not overextend when adjusting valve.

Gauging Water Levels in ISVE Wells and AS Points

GAUGING WATER LEVELS IN ISVE WELLS AND AS POINTS

Purpose

Water levels in ISVE wells are monitored to ensure that sufficient well screen remains exposed in the unsaturated zone. Water level data in AS points is also used as a measure of site dewatering maintenance.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Inhalation of contaminant-laden vapors Dermal contact with pure product or contaminated water	Wear Level D protection when approaching wells. Don Level C respiratory protection before opening wells. Monitor breathing zone with PID. • PID < 5 ppm: continue working in Level C respiratory protection • 5 < PID < 9.99 ppm: use Drager Tube to test for the presence of benzene. If benzene concentration is greater than 5 ppm, evacuate upwind and re-test in 30 minutes. • PID > 10 ppm: if this reading is sustained for 1 minute, close well and evacuate immediately. Document that water level was not measured and consult Project Manger and Site Safety Manager for further direction.
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Slip/trip/fall on uneven terrain	Watch step, be alert for sticks, rocks, vines, ice or cords.
Thermal/cold stress	Dress appropriately for weather, take breaks as necessary, and remain adequately hydrated.
Pinch points from well lid	Use a prying device to allow proper clearance for fingers when opening a well.
Being struck by equipment/vehicles	Wear a brightly colored traffic safety vest when working in highly trafficked areas.

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields
5. Half face or full-face respirator with organic vapor cartridge. A new cartridge should be utilized for each event.
6. Traffic safety vest when working around high traffic areas

Potentially Required PPE

1. Chemical-resistant coveralls (Tyvek or SARANEX) (optional – personnel desiring additional protection from potential splashes)
2. Chemical-resistant overboots (optional – personnel desiring additional protection from potential splashes)

Hazard Identification and Management

1. Have the AS blowers turned off one day prior to water level gauging.
2. Don Level C protection prior to opening well.
3. Inspect ISVE well for signs of wear, damage to the well cap, or evidence of product surcharge.
4. Remove well cap and monitor breathing zone with PID for VOCs.
5. If PID monitoring indicates acceptable conditions (see table above), measure the water level.
6. Clean water level meter, dispose of paper towel in garbage bag, and move to next well.
7. Once monitoring is complete, inform the site safety manager that the AS blowers may be activated.

Product Removal from ISVE Wells

PRODUCT REMOVAL FROM ISVE WELLS

Purpose

Five ISVE wells in the On-Site Area (SVE-52, SVE-53, SVE-62, SVE-72, and SVE-88) currently require removal of free product because product levels in these wells are often high enough to prevent vapor recovery. Thus, these five wells have been reclassified as "product recovery wells" and will be operated as such until enough product can be removed to allow consistent vapor recovery.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Inhalation of contaminant-laden vapors Dermal contact with pure product or contaminated water	Wear Level D protection when approaching wells Don Level C respiratory protection before opening wells Monitor breathing zone with PID • PID < 5 ppm: continue working in Level C respiratory protection • 5 < PID < 9.99 ppm: use Drager Tube to test for the presence of benzene. If benzene concentration is greater than 5 ppm, evacuate upwind and re-test in 30 minutes. • PID > 10 ppm: if this reading is sustained for 1 minute, close well and evacuate immediately. Document that water level was not measured and consult Project Manger and Site Safety Manager for further direction.
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Slip/trip/fall on uneven terrain	Watch step, be alert for sticks, rocks, vines, ice or cords.
Thermal/cold stress	Dress appropriately for weather, take breaks as necessary, and remain adequately hydrated.
Pinch points from well lid	Use a prying device to allow proper clearance for fingers when opening a well.
Being struck by equipment/vehicles	Wear a brightly colored traffic safety vest when working in highly trafficked areas.

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields
5. Half face or full-face respirator with organic vapor cartridge. A new cartridge should be utilized for each event.
6. Traffic safety vest when working around high traffic areas

Potentially Required PPE

1. Chemical-resistant coveralls (Tyvek or SARANEX) (optional – personnel desiring additional protection from potential splashes)
2. Chemical-resistant overboots (optional – personnel desiring additional protection from potential splashes)

Hazard Identification and Management

1. Don Level C protection prior to opening well.
2. Inspect SVE well for signs of wear, damage to the well cap, or evidence of product surcharge.
3. Remove well cap and monitor breathing zone with PID for VOCs.
4. If PID monitoring indicates acceptable conditions (see table above), measure the water level.
5. Clean water level meter and dispose of paper towel in garbage bag.
6. Lower Grundfos pump to the bottom of well. The Teflon discharge line of the pump should be directed into a 55-gallon drum. The pump control box can be plugged into the ISVE control building.
7. Operate pump until product recovery stops. Remove and clean off pump (dispose of any paper towels, etc., in garbage bag and dispose of in hazardous waste rolloff box).
8. Close well and move to the next product recovery well.
9. After pumping is complete, transport 55-gallon drum to the GWTP.
10. The 55-gallon drum contains a dedicated product pump. Attach the pump control box to the dedicated product pump and pump the product into tank T-6.

DPE Pump Maintenance

DPE PUMP MAINTENANCE

Purpose

Submersible pumps installed in the dual-phase extraction (DPE) wells need to be inspected and maintained regularly. The activities require removal of the pumps from the wells for visual inspection or to perform maintenance at the GWTP.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Inhalation of contaminant-laden vapors Dermal contact with pure product or contaminated water	Wear Level D protection when approaching wells Don Level C respiratory protection before opening wells Monitor breathing zone with PID • PID < 5 ppm: continue working in Level C respiratory protection • 5 < PID < 9.99 ppm: use Drager Tube to test for the presence of benzene. If benzene concentration is greater than 5 ppm, evacuate upwind and re-test in 30 minutes. • PID > 10 ppm: if this reading is sustained for 1 minute, close well and evacuate immediately. Document that water level was not measured and consult Project Manger and Site Safety Manager for further direction.
Biological Hazards	**Recommended Control**
None identified for this task	N/A
Physical Hazards	**Recommended Control**
Slip/trip/fall on uneven terrain	Watch step, be alert for sticks, rocks, vines, ice or cords.
Thermal/cold stress	Dress appropriately for weather, take breaks as necessary, and remain adequately hydrated.
Pinch points from well lid	Use a prying device to allow proper clearance for fingers when opening a well.
Being struck by equipment/vehicles	Wear a brightly colored traffic safety vest when working in highly trafficked areas.

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Hard hat
4. Safety glasses with side shields
5. Half face or full-face respirator with organic vapor cartridge. A new cartridge should be utilized for each event.
6. Traffic safety vest when working around high traffic areas

Potentially Required PPE

1. Chemical-resistant coveralls (Tyvek or SARANEX) (optional – personnel desiring additional protection from potential splashes)
2. Chemical-resistant overboots (optional – personnel desiring additional protection from potential splashes)

Hazard Identification and Management

1. Don Level C protection prior to opening well.
2. Inspect SVE well for signs of wear, damage to the well cap, or evidence of product surcharge.
3. Remove well cap and monitor breathing zone with PID for VOCs.
4. If PID monitoring indicates acceptable conditions (see table above), remove and clean off pump (dispose of any paper towels, etc., in garbage bag and dispose of in hazardous waste rolloff box).
5. Secure well lid.
6. Follow similar procedures for reinstalling the pump.

APPENDIX C

MONITORING/SAMPLING ACTIVITIES OUTSIDE THE BARRIER WALL

- **Groundwater Level Measurements/Sampling**
- **Site Investigation Activities**

Groundwater Level Measurements/Sampling

GROUNDWATER LEVEL MEASUREMENTS/SAMPLING

Purpose

MWH measures water levels in wells outside the barrier wall to monitor off-site movement of groundwater contaminants. Groundwater samples are collected from these wells and analyzed to ensure that potential contaminants do not pose a threat to nearby residents.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	**Recommended Control**
Dermal contact with contaminated water	Wear Level D protection.
Biological Hazards	**Recommended Control**
Poison ivy, poison oak, and/or poison sumac	• Wear long sleeves. • Tuck pants into socks or use overshoes.
Stinging and biting insects	• Use appropriate insect repellants. • For ticks, wear long sleeves, tuck pants into socks or use overshoes. Check body for ticks at end of each day in the field.
Animals	• Avoid physical contact with animals. • Do not threaten or corner animals. • Make noise to get animal to retreat. • Stay in or return to vehicle.
Physical Hazards	**Recommended Control**
Heavy lifting	Size up load before lifting, ask for assistance if necessary, and use proper lifting techniques.
Slip/trip/fall on uneven terrain	Watch step, be alert for sticks, rocks, vines, ice or cords.
Thermal/cold stress	Dress appropriately for weather, take breaks as necessary, and remain adequately hydrated.

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Safety glasses with side shields

Potentially Required PPE

1. Chemical-resistant coveralls (Tyvek or SARANEX) (optional – personnel desiring additional protection from potential splashes)
2. Chemical-resistant overboots (optional – personnel desiring additional protection from potential splashes)

Hazard Identification and Management

1. Inspect well for signs of wear, damage to the cap or lock, or evidence of tampering.
2. Remove well cap and measure the water level using an electronic water level meter. If the well is to be sampled, collect a groundwater sample according to the task-specific Field Sampling Plan or Work Plan.
3. Clean the equipment, replace the well cap, decontaminate sampling equipment, and move to the next location.

Site Investigation Activities

SITE INVESTIGATION ACTIVITIES

Purpose

"Site investigation activities" refers to a broad subset of activities that include, but are not limited to, soil sampling, well installation, and chem-ox remediation through direct push drill rods. Procedures for these activities are task specific. Please consult the appropriate work plan for detailed procedures.

Potential Hazards Unique to Task

Chemical/Toxicological Hazards	Recommended Control
Inhalation of VOCs	• Wear Level D protection • Monitor breathing zone with PID – PID < 1 ppm: continue working in Level D respiratory protection – PID > 1 ppm (sustained): use Drager Tube to test for the presence of benzene. • If benzene < 1 ppm and PID < 200 ppm, continue working in Level D. • If benzene > 1 ppm stop work and withdraw from area for 15 minutes. Resample with a new Drager Tube. If benzene > 1 ppm cover exposed media, reduce work rate, and resample in 15 minutes. If benzene is still > 1 ppm, stop work and consult Regional Health and Safety Manager. – PID > 200 ppm: Stop work and withdraw from area for 15 minutes. Retest after 15 minutes, if PID is still > 200 ppm cover exposed media, slow work rate and retest in 15 minutes. If reading is still > 200 ppm, stop work and consult Regional Health and Safety Manager.
Biological Hazards	**Recommended Control**
Poison ivy, poison oak, and/or poison sumac	• Wear long sleeves. • Tuck pants into socks or use overshoes.
Stinging and biting insects	• Use appropriate insect repellants. • For ticks, wear long sleeves, tuck pants into socks or use overshoes. Check body for ticks at end of each day in the field.

Biological Hazards	Recommended Control
Animals	• Avoid physical contact with animals. • Do not threaten or corner animals. • Make noise to get animal to retreat. • Stay in or return to vehicle.
Physical Hazards	**Recommended Control**
Drill rig	• Only trained individuals may operate drill rig • Use caution when near drill rig
Underground utilities	Conduct a utility search prior to commencement of investigative activities
Excessive noise (due to drill rig)	Wear ear plugs
Slip/trip/fall on uneven terrain	Watch step, be alert for sticks, rocks, vines, ice or cords.
Thermal/cold stress	Dress appropriately for weather, take breaks as necessary, remain adequately hydrated

Required PPE

1. Nitrile or Latex gloves
2. Steel-toed boots or shoes
3. Safety glasses with side shields

Potentially Required PPE

1. Chemical-resistant coveralls (Tyvek or SARANEX) (optional – personnel desiring additional protection from potential splashes)
2. Chemical-resistant overboots (optional – personnel desiring additional protection from potential splashes)

Hazard Identification and Management

1. At least one week prior to conducting any site investigation, call Indiana Underground Plant Protection Service (IUPPS) at (800) 382-5544 to locate any underground utilities.
2. Regardless of the activity, air monitoring of the breathing zone for VOCs should be conducted throughout any work activity that involves subsurface drilling.
3. Monitor breathing zone for VOCs every 15 minutes throughout drilling activities and record data in field book. Also monitor breathing zone near drill rig.
4. If PID monitoring indicates acceptable conditions (see table above), conduct work according to applicable work plan.

ATTACHMENT 1

REVISION LOG

REVISION LOG
ACS HSP FIELD MANUAL

Date	Description of Revision